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REMARKS

Entry of this Amendment is proper because it does require further searching and narrows the issues on appeal.

Claims 1-6, 14-16, 19-22, 25 and 41-47 are all the claims presently pending in the application. Claims 1, 14, 20 and 47 have been amended to more clearly define the invention.

The claim amendments are made only to more particularly point out the invention for the Examiner and not for narrowing the scope of the claims or for any reason related to a statutory requirement for patentability. Applicants also note that, notwithstanding any claim amendments herein or later during prosecution, Applicants' intent is to encompass equivalents of all claim elements.

Claims 1-6, 14-16, 19-22, 25 and 41-47 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Stephens et al. (U. S. Pat. No. 6,563,614).

This rejection is respectfully traversed in the following discussion.

I. THE CLAIMED INVENTION

An exemplary embodiment of the claimed invention, as defined by, for example, independent claim 1, is directed to an optical communication system for amplifying an optical signal propagating through a front optical transmission line mounted at a front stage by using an optical amplifier in an optical repeater and emitting the amplified optical signal to a back optical transmission line mounted at a back stage. The system includes a transmission line compensating device which **generates control light** which is input to one of the front and back optical transmission lines to produce a Raman amplification effect **within** the one of the front and back optical transmission lines outside of the optical repeater based on a control signal corresponding to an optical signal level input from the front optical transmission line (Application at page 8, line 4-page 9, line 8; Figure 1). The optical amplifier is disposed between the transmission line compensating device and the other one of the front and back optical transmission lines.

Conventional optical communication systems have optical signal characteristics which are affected by leakage of pumping light emitted from an optical repeater and a loss spectrum

that is exhibited intrinsically by the optical transmission line. As the number of wavelength-multiplexed signals increase, it becomes more difficult to properly calibrate a difference in output of each signal.

The claimed optical communication system, on the other hand, includes a transmission line compensating device which **generates control light** which is input to one of the front and back optical transmission lines to produce a Raman amplification effect **within** the one of the front and back optical transmission lines, and an optical amplifier which is disposed between the transmission line compensating device and the other one of the front and back optical transmission lines (Application at page 8, line 23-page 9, line 8; Figure 1). This allows the claimed invention to properly control an output of an optical signal and a loss spectrum exhibited by the optical transmission, thus enabling a high quality optical transmission line to be implemented (Application at page 11, lines 13-18).

II. THE ALLEGED PRIOR ART REFERENCE

The Examiner alleges that the Stephens teaches the invention of claims 1-6, 14-16, 19-22, 25 and 41-47. Applicant submits, however, that Stephens does not teach or suggest each and every feature of the claimed invention.

Stephens discloses an optical transmission system which includes an optical signal controller 12 for controlling a characteristic of an optical signal passing between two nodes 14 (Stephens at col. 6, lines 15-19; Figures 1-3). The controller 12 includes an optical compensation source 30 which provides power in a compensating channel λ_c, which is combined with an optical signal channel λ_i (Stephens at col. 7, lines 4-7).

However, Applicant respectfully submits that Stephens does not teach or suggest a transmission line compensating device which includes "*a transmission line compensating device which generates a control light which is input to one of said front and back optical transmission lines to produce a Raman amplification effect within said one of said front and back optical transmission lines mounted outside of said optical repeater based on a control signal corresponding to an optical signal level input from said front optical transmission line*", as

recited, for example, in claim 1, and similarly recited in claims 14, 20 and 47.

Clearly, this feature is not taught or suggested by Stephens. Indeed, the Examiner **surprisingly** attempts to equate the source controller 32 in Stephens with the transmission line compensating device of the claimed invention. The Examiner is clearly incorrect.

Indeed, the Examiner attempts to rely on Figure 4 to support his allegations. However, the Examiner's allegations are **confusing, contradictory and completely unreasonable**.

First, Applicant would point out that the Figure 4 in Stephens includes 4 separate and unrelated embodiments of the optical signal controllers 12. Some of the embodiments of the controller 12 have a feed-backward control scheme, some embodiments have a feed-forward control scheme. (Stephens at col. 7, lines 58-61).

To help the Examiner understand Figure 4, Applicant has attached hereto as Exhibit 1 a copy of Figure 4 from Stephens, in which Applicant has drawn boxes around the four separate and independent embodiments (which Applicant has labeled 12(1) through 12(4) of the optical signal controllers 12.

Applicant respectfully submits that it is impossible to understand which embodiment of the optical signal controllers 12(1) through 12(4) the Examiner is relying on to support his unreasonable allegations. Indeed, **the Examiner appears to be using some features from separate embodiments in an attempt to reject the claims.**

Specifically, the Examiner alleges on pages 2-3 of the Office Action that the fibers connected to the front and back of the Raman fiber amplifier 36 in Figure 4 are equivalent to the front and back optical transmission lines of the claimed invention, and that the source controller 32 is "equivalent to a transmission line compensating device". However, the Examiner goes on to allege that the source controller 32 generates control light by controlling the optical compensation source 30. This allegation is **confusing, contradictory and completely unreasonable.**

Indeed, only embodiment of optical signal controller 12(4) includes a Raman fiber amplifier 36, but this embodiment of optical signal controller 12(4) does not include an optical compensation source 30. In fact only embodiments of optical signal controller 12(1), 12(2) and

12(3) includes an optical compensation source 30.

Thus, it is impossible to tell which embodiment of the optical signal controller 12 in Figure 4 the Examiner is relying on to support his unreasonable allegations. **Applicant would request that the Examiner provide Applicant with another Office Action which of these separate and independent embodiments the Examiner is relying on to support his unreasonable allegations.**

Further, if the Examiner is somehow trying to merge these separate and independent embodiments of the optical signal controller 12(1) through 12(4) to support his allegations, Applicant would submit that this is completely unreasonable. In fact, if this is the case, **Applicant would request that the Examiner provide Applicant with another Office Action identifying some teaching or suggestion in Stephens to support such an unreasonable allegation.**

For the sake of argument, Applicant will assume that the Examiner is referring to the optical compensation source 30 of optical signal controller 12(3) to support his allegation.

First, Applicant would point out that nowhere does Stephens teach or suggest that the source controller 32 in one optical signal controller 12 (4) may be used to control the optical compensation source 30 in optical signal controller 12(3). Indeed, this is completely unreasonable.

Further, Applicant would point out that even assuming (arguendo) that source controller 32 in one optical signal controller 12 (4) controls the optical compensation source 30 in optical signal controller 12(3), Applicant would point out that it is the optical compensation source 30 that provides "power in one or more compensating, or control, channel wavelengths λci" (Stephens at col. 7, lines 6-8). That is, Stephens does not teach or suggest that the source controller 32 **generates** a control light. Thus, the Examiner is attempting to equate the optical compensation source 30 (not just the source controller 32) with the transmission line compensating device of the claimed invention.

However, this is completely unreasonable. Indeed, as noted above, the Examiner attempts to equate the fibers connected to the front and back of the Raman fiber amplifier 36

(e.g., in optical signal controller 12(4)) with the front and back optical transmission lines of the claimed invention. However, in the claimed invention, the control light is input to one of the front and back optical transmission lines to produce a Raman amplification effect within one of the front and back optical transmission lines mounted outside of the optical repeater. **Nowhere does Stephens teach or suggest that the compensating, or control, channel wavelengths λci provided by optical compensation source 30 in optical signal controller 12(3) are input to the fiber connected to the front of the Raman fiber amplifier 36 in optical signal controller 12(4).**

Moreover, nowhere does Stephens teach or suggest that the **compensating, or control, channel wavelengths λci** are provided by the optical compensation source 30 based on a control signal corresponding to an optical signal level input from the fiber connected to the front of the Raman fiber amplifier 36. Therefore, the Examiner's allegations are completely unreasonable.

Further, Applicant would point out that in the claimed invention an **optical amplifier** may amplify an optical signal input from said front optical transmission line and **a control light** input to one of the front and back optical transmission lines **may produce a Raman amplification effect within said one of said front and back optical transmission lines.** The Examiner attempts to equate the Raman fiber amplifier 36 with the amplifier of the claimed invention, then surprisingly alleges that the Raman fiber amplifier 36 in Stephens also produces the **Raman amplification effect which is produced by the control light in the claimed invention. Of course, this allegation is completely unreasonable.**

Indeed, in the claimed invention, the Raman amplification effect is produced **within the** optical transmission line. That is, in the claimed invention, the Raman amplification effect may be produced **by propagating the control light through the optical transmission line** (Application at page 9, line 29-page 10, line 6). This is completely different from the Stephens device in which the controller 12 controls a pump source 38 which supplies pump energy to the Raman amplifiers 36.

Further, Applicant would point out that the Examiner is completely ignoring the term "optical repeater" in the claimed invention. That is, the Examiner attempts to equate the

amplifier 20 in Stephens with the amplifier of the claimed invention, but nowhere does the Examiner identify where Stephens teaches or suggests an "optical repeater". The Examiner must identify where Stephens teaches this feature in another non-final Office Action. The Examiner cannot just decide to ignore the "optical repeater" in the claimed invention on a whim.

Further, if the Examiner is attempting to equate the amplifier 20 with the optical repeater of the claimed invention, Applicant would point out that an "optical repeater" is not necessarily the same as an amplifier. Therefore, the Examiner's allegations are completely unreasonable. Indeed, unlike the claimed invention which includes an optical repeater which may include an optical amplifier (e.g., see Application at Figure 1) **nowhere does Stephens teach or suggest an optical repeater which includes the amplifier 20.**

To further assist the Examiner, Applicant has attached hereto as Exhibit 2 a diagram of an optical amplifier such as optical amplifier 20 in embodiment 12(4) of the optical signal controllers 12 (e.g. from Figure 4 in Stephens). In general, an optical amplifier may include an optical isolator. Therefore, an optical signal input to the optical amplifier through a port A thereof is amplified, and is output as the amplified optical signal from a port B thereof, whereas an optical signal input to the optical amplifier through the port B thereof is not amplified, and cannot be output from the port B thereof.

Exhibit 2 also includes an annotated diagram of embodiment 12(4) of the optical signal controllers 12 (e.g. from Figure 4 in Stephens). Applicant notes that Figure 4 incorrectly identifies feature 26 as an optical combiner. In fact, Applicant submits that this feature is likely an optical distributor 28.

Therefore, clearly Stephens does not teach or suggest a transmission line compensating device which **generates control light** which is input to one of the front and back optical transmission lines to produce a Raman amplification effect **within** the one of the front and back optical transmission lines, and an optical amplifier which is disposed between the transmission line compensating device and the other one of the front and back optical transmission lines.

Therefore, Applicant respectfully submits that Stephens does not teach or suggest each and every element of the claimed invention. Therefore, the Examiner is respectfully requested to

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withdraw this rejection.

III. FORMAL MATTERS AND CONCLUSION

In view of the foregoing, Applicant respectfully submits that claims 1-6, 14-16, 19-22, 25 and 41-47, all the claims presently pending in the Application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the Application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

Date: 8/24/06

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The arrows show the directions of travel of optical signals.

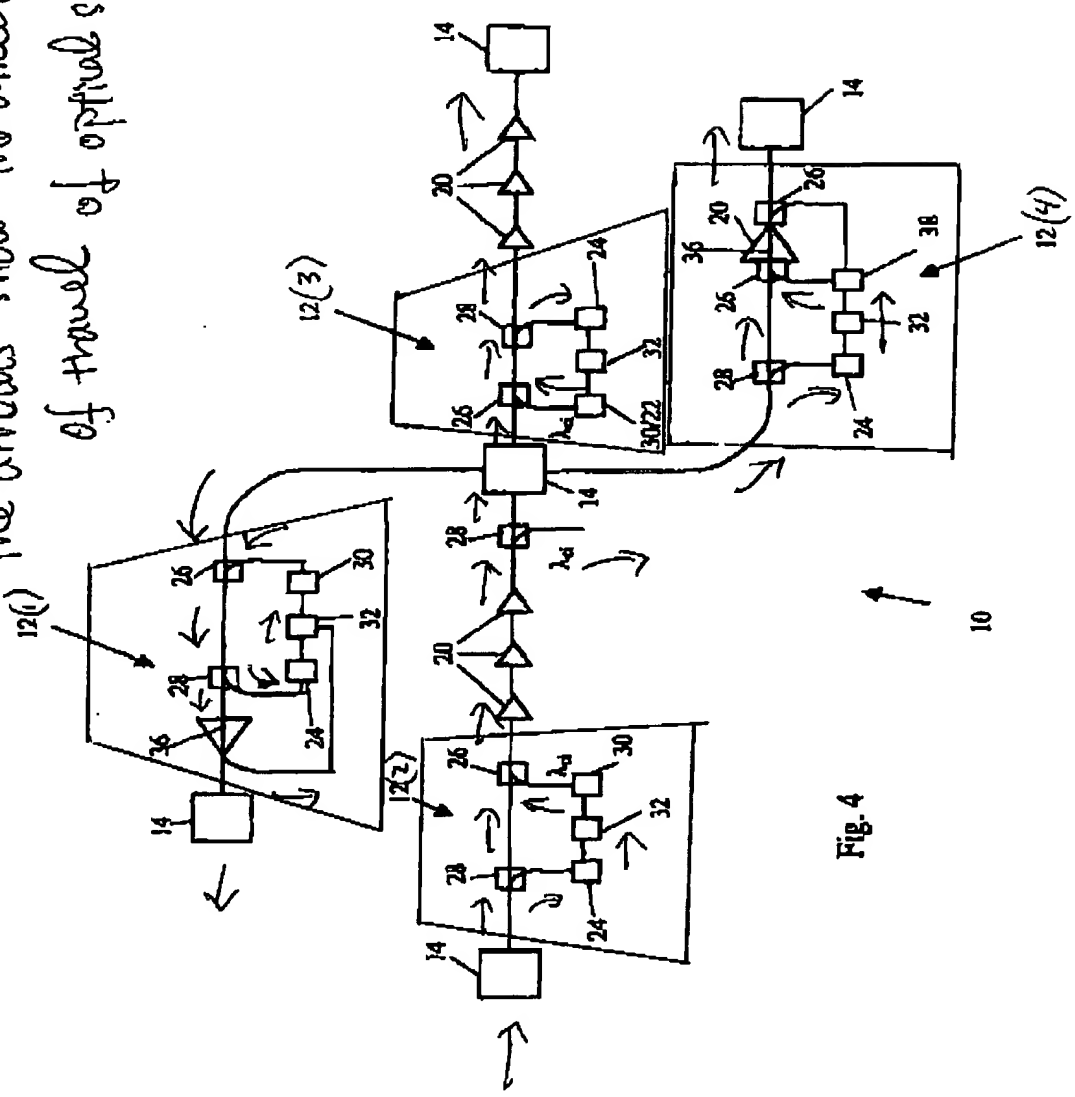
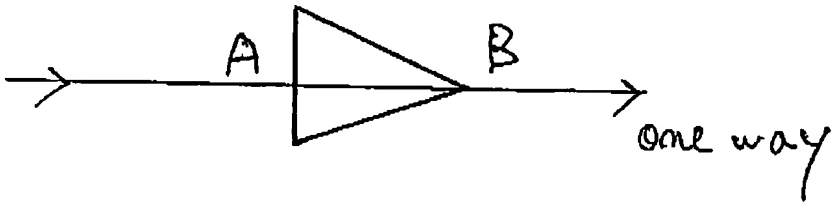


Fig. 4

Exhibit 1

In general, an optical amplifier comprises an optical isolator.

Therefore, an optical signal input to the optical amplifier through a port A thereof is amplified, and is output as the amplified optical signal from a port B thereof, whereas an optical signal input to the optical amplifier through the port B thereof is not amplified, and cannot be output from the port B thereof.



An optical combiner 26 appears to be wrong in writing, and possibly an optical distributor 28 appears to be correct.

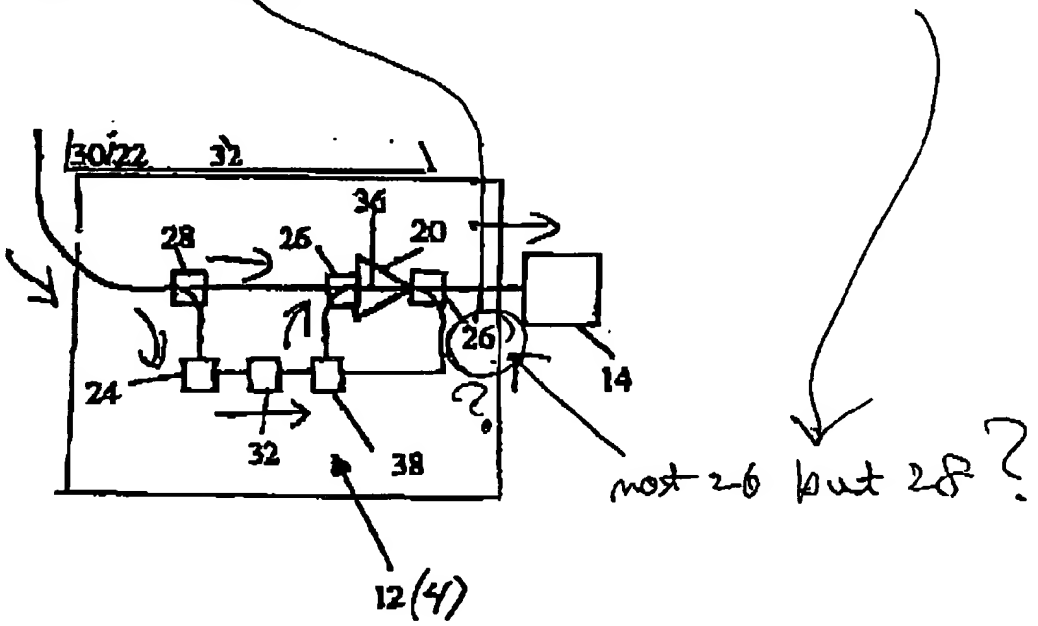


Exhibit 2